An inquiry
Into the Medical virtues of the
Sal Cinchonae and Sulphas Quininae.
In the cure of Intermittent
And Remittent Fevers;
Submitted as an
Inaugural Thesis
To the examination of the
Reverend Frederick Beasley, Provost.
The Trustees,
And Medical Professors of the University of
Pennsylvania.
On the first of November 1823.
For the Degree of Doctor of Medicine.
By Charles Henry Rohr
of
Philadelphia.

To William Gibson M. D.
Professor of Surgery in the University of Pennsylvania.

Dear Sir,

Prompted by inclination, and impressed by the highest respect for Your professional talents, I claim as Your Pupil, the privilege of dedicating to You my Inaugural Dissertation. You, independant of all other considerations, I am impelled to inscribe this essay to You by gratitude for the many opportunities of improvement, and the unwearied attention which You have so kindly afforded me during the term of my Medical studies under Your direction. I laments that it is so unworthy Your acceptance. Look on its faults as You have been accustomed to do on those of its author, and I shall have consolation in reflecting, that Your candour to excuse, is no less eminent than Your abilities to judge

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That You may long continue to enjoy health, and the honours awarded to Your merit, and that the happiness of Yourself and Family may continue to increase, is the unfeigned wish of

Your much obliged friend and grateful
Pupil
Charles H. Rohr.

To
The Reverend Philip F. Meyer D. D.—
This Essay
Is respectfully inscribed,
As a grateful testimony of the
Affection and Esteem,
With which his uniform Friendship
And politeness
Has inspired
The Author.

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Botanical arrangement.

The Genus Cinchona belongs to Linnaeus' fourteenth Natural Order Contortae.

In his sexual system he places it in the Class Pentandria, and Order Monogynia.

The characters which he gives of the specification are as follows:

General Characters.

Calyx. – Superior, one-leaved, five-toothed, permanent.

Corolla. – Monopetalous, tubular, funnel-shaped, deeply five-cleft, tube long, obscurely angular; segments lanceolate or linear.

Stamens. – Filaments five in the middle of the tube; anthers elongated, either shorter than the tube, or projecting beyond it.

Pistil. – Germ inferior, top-shaped, obscure-

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ly angular; style the length of the stamens, stigma thick, either bifid or entire.

Pericarpium.—Capsule crowned with the calyx, two-valved, two-celled; valves opening at their inner side, turned in at their edges, and separating when ripe, so as to have the appearance of two capsules.

Seeds.—Numerous in each cell, oblong, compressed, bordered, attached to a central oblong receptacle.

Essential Characters.

Calyx.—Top-shaped, five-toothed.

Corolla. Tubular, five-cleft.

Stamens. Five, inserted into the middle of the tube.

Capsule. Oblong, two-valved, two-celled, many-seeded.

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Natural History.

This tree is very lofty, sending off large branches covered with rough brown bark: the leaves vary from an ovate to an elliptical shape, the larger approaching more to the former, and the smaller more to the latter figure; they are all entire, nerved, smooth on the upper side, on the under, tomentose, and stand in pairs upon footstalks: the flowers are produced in panicles, and stand upon slender pedicles: the calyx is small, bell-shaped, and cut at the margin into five minute segments: the corolla is funnel-shaped, consisting of a long cylindrical tube, divided at the limb into five segments, which are ovate, or oblong, spreading, on the upper side red, on the under, wooly, and fringed at the edges: the filaments are bristly, placed in the middle of the tube, and furnished with oblong antherae, twisted in a spiral manner.

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the germen is ovate: the style is filiform, some what longer than the stamina, and furnished with a round stigma: the capsule divides into two parts, the cells of which are separated by a parallel partition: the seeds are small and numerous. It is a native of Peru, growing most abundantly on a long chain of mountains, extending to the North and South of Loxa, where its trunk frequently, exceeds in bulk the body of a man. According to Mr. Ceroot, the soil in which these trees thrive best is generally a red clayey, or rocky ground, and especially on the banks of small rivers descending from high mountains. This author also informs us that the most proper season for cutting the bark is from September to November, the only time in the whole year of some intermission from the rain in the mountains.
Having discovered a spot where the trees most abound, they first build huts for the woodmen,

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and then a large hut, wherein they put the bark in order to preserve it from the wet; but they let it lie there as short a time as possible, having first cut a road from the place where the trees grow, through the woods, sometimes three or four leagues, to the nearest plantation or farm house, in the low country, whither, if the rain permits them, they carry the bark forthwith to dry. These preparations being made, they provide each Indian, they being the cutters, with a large knife, and a bag that will hold about fifty pounds of green bark: every two Indians take one tree, whence they cut, or slice down the bark as far as they can reach from the ground; they then take sticks about half a yard long each, which they tie to the tree with strong withs at proper distances, like the steps of a ladder, always slicing off the bark as far as they can reach, before they fix a

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new step, and thus mount to the top; the Indian below gathering what the other cuts; this they do by turns, and go from tree to tree till the bag is full, which, when they have plenty of trees is generally a days work for one Indian. As much care as possible must be taken that the bark is not cut wet; should it so happen, it is to be carried directly down to the low country to dry, for otherwise it loses its colour, turns black, and rots; and if it lie any time in the hut without being spread, it runs the same risk: so that while the Indians are cutting, the mules, if the weather permits, ought to be carrying it down to the place appointed for drying it, which is done by spreading it in the open air, and frequently turning it.
On the trees being entirely stript of their bark they soon perish; and as the number of these trees to which access could be had, was said to be

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not very considerable, it has been supposed that a sufficient quantity of bark to supply the demand, could not long be procured. Condamine, however asserts that the young trees do not die by losing their bark, but send out fresh shoots from the base, and as those which are suffered to become old have time to disseminate & propagate, we trust, the fear of exhausting this valuable medicine is wholly unfounded.
We seem to have no satisfactory account at what time, and by what means the medical efficacy of the Peruvian bark, which is now so well established was first discovered.
Some contend that its use in Intermittent Fevers, was known to the Americans long before the Spaniards possessed Peru, but that they concealed this knowledge from the Europeans, and on the contrary it is asserted by others, that the Peruvians never supposed it to be fit for

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any medical use, but thought, that the large quantities exported thence, was for the purpose of dying, and they actually made some trials of its effects in this way. Condamine says, that according to an ancient tradition, the Americans owe the discovery of this remedy to the lions, which, some naturalists pretend, are subject to a kind of Intermittent fever, of which they were observed to be cured by instinctively eating the bark of the Cinchona. But Geoffroy states that the use of the bark was learned from the following circumstance:— some Cinchona trees being thrown by the winds into a pool of water, lay there, till the water became so bitter that every body refused to drink it. However, one of the neighbouring inhabitants being siezed with a violent paroxysm of fever, and finding no other water to quench his thirst, was forced to drink this, by which he was perfectly cured. He afterwards related the circumstance to others,

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and prevailed on some of his friends who were ill of fevers, to make use of the same remedy, in whom it proved equally successful. The use of this excellent remedy was, however, little known, till about the year 1638, when a signal cure having been performed on the Spanish Viceroy's lady, the Countess del Cinchon, at Lima, it came into general use, and hence was distinguished by the appellation Pulvis Comitissae; also called Cortex China china, or Chinchina, Kina Kina, or Kinkina, and Quina quina or Quinquina. On the recovery of the Countess, she distributed a large quantity of the bark to the Jesuits, in whose hands it acquired a still greater reputation, and by them was first introduced into Europe*, and thence called Pulvis Jesuiticus, Pulvis Patrum, and also Cardinal de Lugos powder, because that charitable prelate bought a large

*Louis the fourteenth, when Dauphin, was said to be one of the first in Europe who experienced its efficacy.—

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This bark is brought to us in pieces of different sizes, some rolled up in short thick quills, and others flat: the outside is brownish, and generally covered in part with a whitish moss: the inner side is of a yellowish, redish, or rusty iron colour. The best sort breaks close & smooth, and proves friable between the teeth: the inferior kinds appear when broken, of a woody texture, and in chewing, of separate into fibres. The former pulverizes more easily than the latter, and looks, when powdered, of a light brownish colour, resembling that of cinnamon, or somewhat paler. It has a slight smell, approaching as it were to mustiness, yet so much of the aromatic mixed as not to be disagreeable. Its taste is considerably bitter, astringent, and very durable in the mouth, and accompanied with some degree of aromatic warmth, yet not sufficient to

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prevent its being ungrateful. Besides this bark, that of several other species of Cinchona have been recommended for medical use by different authors; especially the Cortex Peruvianus Ruber, also that of the Cinchona Caribaea or Jamaica bark; that of the Cinchona Floribunda produced at St. Lucie, and that of two or three other species produced at Santa Fé. The first of these is in much larger and thicker pieces than the common, most of them are concave, though not rolled together like the quilled bark. They break short, like the best common bark, and appear evidently composed of three layers: the outer is thin, rugged, frequently covered with a mossy substance, and of a reddish brown colour. The middle is thicker, more compact, and of a darker hue: it is very bitter and resinous. The innermost layer is more woody and fibrous, and of a lighter red.
Lewis' Materia Medica, p. 485.

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In powdering this bark, the middle layer, which seems to contain the greatest proportion of resinous matter, does not break so readily as the rest; a circumstance to be attended to, lest the most active part should be left out in sifting. The red bark, to the taste, discovers all the peculiar flavour of the common Peruvian Bark; but much stronger. An infusion in cold water is intensely bitter, more so than the strongest decoction of the officinal bark. Its astringency is in an equal degree greater than that of the infusion of the common bark, as is shown by the addition of the Sulphas Ferri. The spirituous tincture of the red bark, is also proportionally stronger than that of the pale. The quantity of matter extracted by rectified spirit from the powder of the former, was to that of the latter, as three to two in one experiment, and as 229 to 130 in another; and yet, on infusing the two residuums of

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the first experiment in boiling water, that of the red bark gave a liquor considerably bitter, and which struck a black with Sulphas Ferri; while that yielded by the other was nearly tasteless, and void of astringency.*

Respecting the medicinal properties, we have several respectable authorities, showing, that as the red bark possesses the same properties with the common, in a much higher degree, so it has been found of more efficacy in the cure of Intermittents,† and hence it is thought to be that, which according to Aiton, the Spaniards called Cascarilla colorada, and was probably the kind originally brought to Europe, and which proved so successful in the hands of Sydenham, Morton & Lester; for it appears from the testimony of the oldest practitioners, that the bark first employed was of a much deeper colour than the common.‡

* Lewis. † Irving's & Thacher's exper. ‡ Med. Trans. v. III. p. 161.

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The red bark was first imagined by laymen to be that of the full grown trees, the branches and young trees yielding the common bark, but this opinion the Doctor seems afterwards to have abandoned, for in the third edition of his pamphlet on this subject, he says: "that he had lately seen some exceedingly good red bark, imported by a Spanish merchant, a considerable portion of which was as small as the quilled bark in common use &c It was exceedingly resinous, and gave evident proofs of its being the quill of the larger red bark which was in the same chest." — If the pale and red bark were really the produce of the same species of Cinchona, the latter differing from the former only by acquiring greater maturity, we should find the darkness of the colour of the pale bark to correspond proportionately with its thickness, or the size of the quill, which is certainly not the case. The Cinchona Cordifolia is described and figured by Jacquin, &

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Doctor Wright; it grows in Jamaica, where it is called the sea-side bark. The Cinchona Floribunda, a bark tree of St Lucie, a figure of which may be found in the Philosophical Transactions; also in Rosier's observations sur la Physique, affords a bark which is likewise said to have been used with advantage. In its recent state it is considerably emetic and cathartic, properties which it retains in some degree on being dried; so that the stomach does not bear this bark in large doses, and in small ones, its effects are not such as to give it any particular recommendation.

The Peruvian bark yields its virtues both to boiling and cold water; but the decoction is thicker, gives out its taste more readily, and forms an ink with a chalybeate more suddenly than the fresh cold infusion. This infusion contains at least as much extractive matter, but more in a state of solution, and its colour, on

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standing with a chalybiate becomes darker, while that of the decoction becomes more pale. When they are of a certain age, the addition of a chalybiate renders them green; and when this is the case, they are found to be in a state of fermentation & effete. Mild or caustic alkalies, or lime, precipitate the extractive matter, which, in the case of the caustic alkali is dissolved by the farther addition of the alkali. Lime water precipitates less from a fresh infusion than from a fresh decoction; and in the precipitate of this last, some mild earth is perceptible. The infusion is by age reduced to the same state with the fresh decoction, and then they deposit nearly an equal quantity of mild earth and extractive matter, so that Lime water, as well as chalybiates may be used as a test of the relative strength and perishable nature of the different preparations of the different barks.—Accordingly, cold infusions are found

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by experiments to be less perishable than decoctions; infusions and decoctions of the red bark than those of the pale; those of the red bark, however, are found by length of time to separate more mild earth with the Lime water, and more extracted matter. Lime water, as precipitating the extractive matter, appears an equally improper and disagreeable menstruum. Water has been found to suspend the resin by much less gum than has been supposed. Rectified spirit of wine extracts a bitterness, but no astringency, from a residuum of 20 affusions of cold water, and water extracts astringency, but no bitterness, from the residuum of as many affusions of rectified spirit. The residua of both are insipid."

From many ingenious experiments made on the Peruvian Bark by Dr. Irving, published in a Dissertation which gained the prize-medal, given by the Har-

"Edinburgh New Dispensatory.

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cetian Society of Edinburgh in 1785. the powers of different menstrua upon the Peruvian Bark is ascertained with greater accuracy than had before been done: and it appears, that with respect to comparative power, the following fluids act in the order in which they are placed:

Dulcified spirit of Nitre:— Caustic ley:— French Brandy:— Rhenish Wine:— Vinegar diluted:— Dulcified spirit of Nitre:— Mild volatile alkali:— Rectified spirit of wine:— Mild vegetable alkali:— Lime water:—

The anti-septic powers of vinegar and bark united, are double their sum taken separately.

Though the bark on its first appearance was and even for some time afterwards, was reported by some eminent Physicians to be a dangerous remedy; yet these prejudices are entirely done away, and its character is now universally established: so that the disputes which now subsist are

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confined to the mode of operation, and the manner in which it is most advantageously administered.

I am now to speak particularly of two recent preparations from the Cinchona, whose powers in the cure of Intermittent fevers have been greatly extolled. The first to which I allude was called in the shops, Sal Cinchonae.

The method employed by a manufacturing chemist of this city for its preparation, consists in infusing a certain quantity of the Cortex Peruvianus in a given quantity of water, (soda) for 24 hours, straining the liquor thus obtained, and evaporating to dryness, which leaves a dark brown residuum, being the article in question. This medicine has been extensively employed by the Physicians of this city, For a time it was thought to be very efficient, and indeed in the extensive practice of a gentleman of the profession

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of my acquaintance, in the Northern Liberties, is almost superseded the exhibition of the Bark in substance. On its first introduction it was employed in minute doses. The fourth, to the half of a grain were said to be proper proportions for an adult. Finding by repeated trials that the by no means answering the expectations of those employing it, the doses were from time to time increased, until they were finally established at ten or twelve grains every two hours, in pill or solution.

In the course of the summer of 1822, the great expectations which had been formed of it, abated in a considerable degree in the estimation of those practitioners whose opinions I have had an opportunity of consulting. I have not had the advantage of personal experience with the medicine, but shall subjoin what information on the subject I have been able to collect from the practice of others.—

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Doctor George Uhler, of the Northern Liberties, has obligingly communicated to me the result of his experience with the article, after a fair and impartial trial, which he has politely permitted me to transcribe.— "I have employed the Sal Cinchonae in a great number of cases, with its operation in a ~~great~~ number of instances I have had ~~great~~ reason to be pleased: but particularly so where the bark in substance, or more bulky preparations could not be retained on the stomach, from the irritability of that organ. Where this state of things existed, I have found it to remain, when all other preparations were rejected by vomiting."— The opinion of Doctor Alexander Knight, port physician of this city, concurs exactly with the preceding. He gave a mixture of Sal Cinchona ℥iij Extr: Cort: Fl. ℥iss ℥i. and gg. Pontes ℥vj. in one particular instance, in doses of a dessert-spoon full every three hours, to a child three years old.—

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The following communication is from my friend Doctor Jno. Uhler in answer to a desire I expressed of having an abstract of his experience with the Sal Cinchonae. — "According to your request, I give you this brief statement of my experience with the Sal Cinchonae. I was called to see M. — S. —, who at the time of my visiting her was labouring under Remittent Fever. I prescribed an emetic &c. and during the apyrexia attempted to give an infusion of the Baiss, Serpentaria, and Orange peel, which I generally found to sit well on the stomach, but in this instance it was totally unable to bear the smallest quantity of the medicine. The same difficulty occurred in the administration of some other preparations.
The case eventually took on a typhoid character, with a total prostration of strength, the stomach still rejecting every thing, and resisting every article usually employed in such cases

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to quiet its irritability. – In this dilemma, I commenced the use of the Sal Cinchonae: the medicine was retained without difficulty, and the patient gradually recovered. The form I used in this case was as follows:

℞ Sal Cinchonae ʒij.
Mucil: G: Arabic: ℥j.
Aqua Menth: Piper. ℥v. M.

of which a table-spoon full was given every hour and a half. – I have not used the medicine often, but from the little experience I have had with it, it appears to be pretty well adapted to cases of the above character, though, to be of service it must be given in large doses. – I am enabled to speak in more decided terms of the Sulphas Quininae, another late preparation from the Peruvian Bark, than in the preceding instance. The prevalence of Intermittent and Remittent Fevers in the Northern suburbs of the city

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this season, afforded me a good opportunity of personally testing this medicine.
Previous, however, to transcribing my own diary, or giving the experience of others, I will subjoin the formula for the preparation of the medicine employed by the same chemist who furnished me that for the formation of the Sal Cinchonae. It is as follows:
Digest for 24 hours, a quantity of Peruvian Bark, with four times its weight of water, previously mixed with a sufficiency of Sulphuric Acid to saturate the salifiable base of the bark. Strain off the liquor, and add Carbonas Calcis to neutralize the acid. Gather the precipitate, wash, dry by a moderate heat, & pulverize it: put the powder into a close vessel with six times its weight of alcohol; having agitated it well, by heat gradually applied, raise it to a boiling temperature.—

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This effected, remove it from the fire, suffer it cool and the precipitate to fall down: strain and saturate with sulphuric acid, Evaporate and chrystallize. By this process the Sulphate of Quinine is afforded, white, and of an intense and permanently bitter taste, and without odour.

It is used in pill and solution: the latter mode of administration is particularly suited to children, where difficulty is often experienced in getting them to swallow pills, and also possesses the advantage of admitting the doses to be graduated with more accuracy to suit the age, habit &c.—

The medium proportions for adults is one, to one and a half grain every hour.-

Dr. P. M.—, in speaking of the article says: after using the medicine in a great number of cases, I have been highly gratified with the operation of

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the remedy, and cannot speak of it in higher terms than by saying, considering the great power it possesses over the epidemic, and its now than common prevalence during the summer and autumn, I do not know what we should have done without it."

I have also to acknowledge my obligation to Dr. J. - M. - for the following paper, accompanying his opinion on the Sal Cinchonae.

"Of the Sulphate of Quinine I can speak from more extensive experience, but having been very much engaged during the prevalence of our last epidemic, I did not make any minutes of cases, but can give you a few from memory. — I was called to see Mrs. F. —, who was labouring under intermittent fever. After the usual evacuations, I prescribed Bark in combination with Serpentaria, Super-tartrate of Potash, Sulphate of Alumine & Myristica Mos=

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chata, which I have always found an excellent combination. She continued in the use of this prescription for upwards of two weeks, during which time she was taken in labour, without any beneficial effect. She grew worse, and I ordered in place of the preceding the Sulphate of Quinine in doses of one grain every hour during the apyrexia. She took ten pills, & was cured; having had but one chill after the commencement of their use. About two weeks after, she suffered a relapse in consequence of exposure, I gave the Quinine, and she had not another paroxysm.

I could go on to give you cases without number, but do not consider it necessary to burthen your patience with a formal history of each, the above case being much the general result. In many cases there was not a repitition of the paroxysm when Quotidian and rarely when Tertian.

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Upon the whole, I deem it the most important and valuable remedy employed in Intermittent fever, and speake thus highly from a vast deal of experience with it."

I have consulted the views of several other practitioners, who agree with those of I have enumerated, but to transcribe them more in detail would swell my paper to a size larger than is desirable.

For the following patients, in whom I had an opportunity of personally testing the medicine, I am also indebted to Dr. J. U—, one of the physicians of the Guardians of the Poor.—

September 24th. Hannah C.— aged 14 years, with Quotidian Intermittent. At this time she had laboured 4 weeks under the disease. She had received no medical treatment previous to my seeing her. The symptoms being such as usually attend the disease, I think the enumeration of

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of them unimportant. Finding it indicated, I prescribed a cathartic of Calomel & Rhubarb. I ordered her the Sulphas Quininae in doses of half a grain every hour during the apyrexia.

25th. On visiting her to-day, I found that the exacerbation had recurred at its usual hour, the disease having undergone no change since the preceding day.

26th. My patient experienced no paroxysm since yesterday.

Though I visited my patient daily on the 27th, 28th, 29th. and 30th. yet the attack was not renewed.

October 4th. She has not had a return of her complaint since I last saw her.

From the exposure to which persons in her condition are subjected, I thought it prudent to continue the medicine until the 4th, recommending it to be given at longer intervals, say half a grain every hour and a half on the 27th. every two hours

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on the 28th, every three hours on the 29th, and so on. To-day I discharged her from further treatment, cured.
In the same family with the preceding case were other three children, labouring under the same disease, whose treatment was similar to their sister.
25th. They had an accession of the paroxysm at the usual hour.
26th. Two of the children escaped a renewal of the exacerbation to-day. The third had suffered its accession, but in milder form.
27th. None of them had a return of the fever.
28th. 29th. 30th. On these three days they experienced no symptom of a renewal of their complaint.
October 4th. They continue free from the disease.
To them I also directed that the medicine, as in the case of their sister, should not be given up before the 4th of October.
Discharged from further treatment, cured.

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September 25th. Mrs. W. —, aged about 50. This was, as in the former instances a case of Intermittans of the Quotidian form, which had existed for 5 weeks. She had been under medical treatment three days previous to this date, and had taken the Sulphate of Quinine: the dose prescribed for her was one grain every hour. She stated to me that she was much improved since using the medicine, and that the paroxysms now occurred later than they had before taking the pills. I recommended them to be continued.

26th. she informed me that she had suffered no attack since yesterday.

The 27th. 28th. 29th. & 30th. brought with them no return of fever. —

October 4th. I called again to see her, and understood that she had felt no interruption in her customary employments from a return of her complaint since last I saw her. —

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The medicine was continued to this date gradually decreased. — Discharged cured.—

September 25th. The two children of Mrs. N. — were attacked with the epidemic about the same time with their mother; the youngest of whom, a boy of 4 years of age, had not another paroxysm after one day's employment of the medicine! the other, a girl of 11 years still laboured under the disease.

26th the boy remained free from fever: his sister had her accustomed paroxysm.

27th. Neither of them experienced its return.

28th. The girl complained of a slight chill and fever to-day.

29th. They suffered no exacerbation.

30th. They continued exempted from a return of their complaint.

October 4th. On enquiring of Mrs. N. — to-day, she said that the children had retained their

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health since my last visit.
The caution to prevent a relapse having been observed, I discharged them, cured.
September 25th. Mrs. E— and two children.
These were cases of the prevailing epidemic, of the Quotidian form, which had subsisted two weeks previous to their having made application for medical advice. I directed the Sulphate of Quinine in hourly doses of one grain for the Mother, and proportionate ones for the children.
26th. I could perceive but little variation in my patients
27th. Mrs. E— stated that her last paroxysm was less distressing than any former one. The oldest child had somewhat improved, and the youngest experienced no exacerbation.
28th. The disorder continued to decline in Mrs. E— the eldest remained much the same as yesterday, the other suffered no renewed attack.—

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29th. They all escaped an exacerbation.
On the 30th they still remained exempted from the disease.
October 4th. I paid a visit to this family, and found that none of them had relapsed since the 30th.—
Discharged.
September 26th. Mrs. Z.—, a person of 71 years of age, residing in the family of Mrs. E.—, complained of great pain in the head, back & limbs, dullness and drowsiness. Visiting my patients on the 27th. she informed me that soon after my departure yesterday, a regular paroxysm of Intermittent fever had come on. Immediately after its abating, she took the Quinine Pills, and continued their use through the day.
The 28th. 29th. & 30th brought no return of the paroxysms.
October 4th. No relapse having occurred in this case since my last visit, I discharged her cured.

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September 29th I called to see Mrs. Eliza D.—, who I found labouring under remittent fever, with nausea, pain in the head & extremities. I learned on enquiry that this had been originally a case of regular quotidian intermittent, which, after 10 days continuance under that form, had degenerated into what I now found it. I premised an emetic, and directed the Sulphate of Quinine in the remissions of the fever. I also recommended the following formula during the exacerbations:

℞ Pulv: Nitr: Potass: ʒij
" Rad: Ipecac: gr. vj.
" Opii. — " j. M.

Div. in chart: No vj. — one powder to be taken every two hours. —

30th. Seeing my patient, she stated to me that after the operation of the emetic she felt relieved of the sickness of stomach & pains; with a returning appetite: the remission was also

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considerably longer than after her former paroxysms, and suffered less from the violence of the fever.—
October 1st. No exacerbation occurred since my last visit.
4th. I found my patient fast recovering her strength, and no return of her disease.
Discharged from further treatment.—
The foregoing cases are a few of which I kept minutes: I could have narrated several others, but as they offer very little variation from the preceding, I have not recorded them.
It may not be amiss to state that these were not selected cases, but consigned to me as their recommendations were presented.
A subject of vital importance to practitioners, as their credit, and the lives of those under their care are jeopardised by it deserves notice. It is, that the high price at which this medicine is sold, may, and already has caused the adultera=

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tion of it. In two instances of which I have been apprised by a gentleman of the faculty, which came under his own cognizance, (being persons under his medical attendance) the most serious consequences had like to have resulted from the admixture of arsenious acid with the article.
In looking over the last number of the Journal of Medical Science, I read the following remarks, which I think not irrelevant to the subject I have been treating:
Messrs. Pelletier & Caventon have long been convinced that a great number of vegetable substances, possessing strong powers over the animal economy, owed their energy to a salifiable base, as the morphine in opium, the strychnine in nux vomica, the veratrine in helebore &c. — They therefore began to experiment on Cinchona, with the view of discovering a salifiable base if any. They soon found that the Cinchonine, or chrys=

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tallizing principle of Garnil of Lisbon, was a substance of this kind united with an oily matter. They combined this substance with different acids, ascertaining the form, proportions and properties of its salts, which all had a bitter, sub-aromatic flavour, proper to the pale bark, which was only used by Garnil. The Cinchonine itself has this peculiar taste, but much less marked, owing to its high degree of solubility. Pursuing the examination of the pale bark, Messrs. P. & C. — determined also the nature of the other component substances, which, joined to the Cinchonine are as follows: 1.) Cinchonine united to Kinic acid: — 2.) a green oily matter: — 3.) Cinchonic red: — 4.) Red soluble colouring matter (tannin) 5.) Yellowing matter: — 6.) Kinate of lime: — 7.) Gum: — 8.) Starch: — 9.) Ligneous matter: —

If we enter into a consideration of these substances, we shall see the greater number, viz: the Cinchonic

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red, the oily matter, the gum, the ligneous matter and the starch cannot possess any of the medical virtues of the bark, of which they have not the taste: the greater number of them are even insoluble. The soluble colouring matter or the tannin cannot either be regarded as the active substance in the cinchona, for if the latter owed its virtues to any tannin matter, other barks, very rich in this principle, ought also to have the properties of the cinchona in proportionate energy according to the tanning matter they contain, but which is contrary to medical experience. There remains the Nitrate of Lime, but this salt when pure has no bitter taste, and is besides insoluble in alcohol. The alcoholic tinctures of bark, therefore, do not contain it, and they are nevertheless febrifuge. Every thing induces us to believe that the active principle of the bark is the cinchonine; consequently it is to this substance & to its salts that

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the attention of the physician and his therapeutical researches ought to be directed. Phila^da Journ. p. 263.

Messrs Pelletier and Caventon, in analyzing the yellow bark, obtained a substance not chrystallizable, and differing from Cinchonine in physical and chemical properties. It was a salifiable base, its capacity for acids being different from Cinchonine, and its salts more bitter. This substance has been denominated Kinine.

The analysis of red bark presented an extraordinary fact— the simultaneous presence of Cinchonine & Kinine, and each in a greater quantity than afforded by the pale and yellow bark. The red bark is therefore justly regarded the best.—

Process employed by Mr. Pelletier for procuring the Cinchonine and Kinine.

Repeated alcoholic tinctures of the bark are first made, and by evaporation, the alcoholic extract is obtained. It is in this extract that the Cinchonine

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or the Kinine is found, which exists in the Peruvian bark. To obtain the alkaline substance of a suitable purity, the extract is boiled in a certain quantity of water, to which has been added a few drops of hydrochloric acid: the liquor after cooling is filtered — then concentrated, and treated with an excess of magnesia — boiling it for a few minutes, the liquor is again suffered to cool, and again filtred. The precipitate received on the filter is composed of Kinine, calcined magnesia, tannin and kinchonic red. Wash the precipitate in cold water, dry it in a sand bath, and treat it with boiling alcohol, which dissolves the alkali, and leaves the magnesia and tannin united to the colouring matter. It remains but to evaporate the alcohol, and obtain the Kinine of a superior purity. The alkali of the kinchona thus prepared is sometimes impure from an admixture of oily matter — to separate which, and purify it, we

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must dissolve it anew in an acid largely diluted with water, and treat it for the last time with magnesia and alcohol as before mentioned. —
In the same work from which these extracts are made, may be found another mode of preparing the article as directed by M. Badolier in the an. de Chemie, vol. XVII. p. 273.
The Sulphate of Kinine has now been employed by a great number of French physicians in fevers of type, with considerable uniformity of success. M. Double has administered the salt in doses of two grains morning and evening, which have been sufficient to cause the fever to cease. To prevent a relapse, however, it was continued for some days longer.
In other experiments made at the Hospital de la Charité, five grains have been given daily in simple quotidian fevers, and continued for 5 days. From the very first dose the recurrence of the paroxysms was prevented.

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Doctor Bally has reported nine cases of fever to the Royal academy of Medicine, cured radically by the Sulphate of Quinine. It appeared to M. Bally, that ten grains given in five doses during the apyrexia, were sufficient to check at once the fever. In autumnal intermittents, however, he conceives that larger doses will be necessary. Two great and obvious advantages of the salt of bark over the powder are, the smallness of the dose, whereby the stomach is saved from nausea and oppression, and the freedom from astringency, it being rather indeed of an aperient than of an astringent nature. The dose may be carried to 28 or 30 grains in the 24 hours, which would be equal to about three ounces of the powder. In pernicious fevers, when it is desirable, during a short remission, to introduce a large quantity of the Cinchona, this new preparation will be of incalculable value! M. Duval, second naval physician at Brest, has

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sent up a memoir of seventeen cases of Intermittent fevers of different types, cured by the Sulphate of Quinine. The medicine was prepared by Messrs. Vasse and Colomb, of Brest, who employed a new process, which consisted in boiling the yellow bark in water acidulated with acetic acid, and precipitating the alkaline principle by ammonia. M. Renaudin, M. Kallé, and M. Robiquet have also furnished various notices of this interesting discovery."

That the sulphas Quininae is a valuable remedy, a perusal of the authorities I have given, and the above-enumerated cases will be sufficient to show. In its employment I refrained from using any auxiliary medicines, (save in one instance) in order that the results might be the more conclusive. True it is that several practitioners have informed me that they have seen instances where it has produced diarrhoea, and some other symptoms which the bark is known to give rise to

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in some cases, but these instances are of rare occurrance. I have never seen any such effects arise out of its use. —

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